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ABSTRACT

This bulletin is one in a series of environmental education activity guides for grades K-12, developed and field-tested by teachers in the Montgomery County (Maryland) Public Schools. Primarily for use in the middle grades four through six, the guides are not intended to constitute complete units in themselves. They are, rather, a compilation of activities considered appropriate for particular environmental studies. In this guide about the weather, for grades four through six, are activities entitled: Observing Weather, Understanding Humidity, Measuring Humidity, Relating Humidity to Other Elements of Weather, Constructing a Barometer, Using a Barometer to Measure Air Pressure, Constructing a Weather Vane, Using a Weather Vane to Find Wind Direction, and Weather Predicting. Indicated for each activity are the instructional objective, procedures to follow, and materials required. Teacher notes are added when necessary. A student evaluation sheet concludes the bulletin. Related documents in the series are SE 015 885 through SE 015 886 and SE 015 888 through SE 015 893. (BL)

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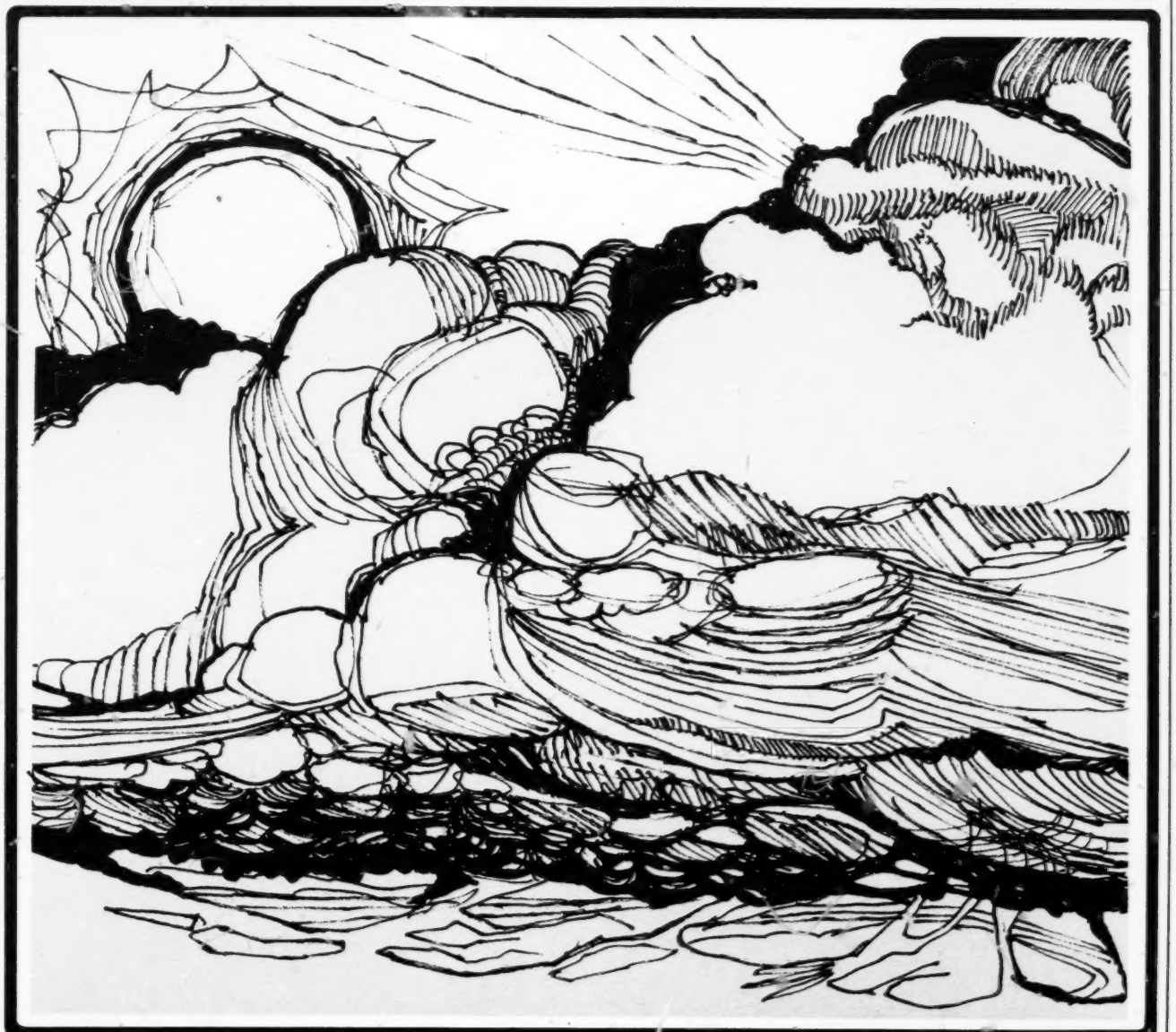
Activities for Studying

Weather



Environmental Education Series · Bulletin No. 247-C

MONTGOMERY COUNTY PUBLIC SCHOOLS · ROCKVILLE, MARYLAND · Homer O. Elsenrood · Superintendent of Schools

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ENVIRONMENTAL EDUCATION SERIES
ACTIVITIES FOR STUDYING WEATHER
GRADE LEVEL 4 – 6

Bulletin No. 247-C

Montgomery County Public Schools
Rockville, Maryland
Homer O. Elseroad
Superintendent of Schools

INTRODUCTION

For some time, there has been a need for curriculum materials to assist teachers who wish to move the teaching/learning experience beyond the school walls. Although individual schools have prepared materials useful to their own unique purposes, such information and teaching aids have not generally been shared with other schools.

This series of bulletins on Environmental Education was developed after arrangements were made in Area 11 for approximately a dozen 12-month teachers to produce outdoor education materials during the summer of 1969. Field testing of these materials occurred, primarily in Area 11, during the 1969-70 school year.

In the summer of 1970, an Outdoor Education Curriculum Development Workshop was conducted at Randolph Junior High School, during which twelve teachers developed additional materials and reviewed and tested those prepared earlier.

The bulletins in this Environmental Education series are not intended to constitute complete units in themselves. They are, rather, a compilation of activities considered appropriate for particular environmental studies. Whether the series should be used separately or as a supplement to other aids should be determined by the needs and purposes of each teacher and his students.

A word of explanation about format: Each activity suggested has its own stated instructional objective. The achievement of that objective will be an individual experience for each student, even though in some cases the procedures suggested may be group- rather than individually-directed.

PURPOSE

This unit is not intended to develop in the child a full awareness of how or why weather functions. It is intended to develop an awareness of the interdependence of various types of weather conditions and the ability to use some observations to predict, with some degree of success, future weather patterns. The activities have been developed with the idea of making as much use as possible of the outdoor environment.

It should be mentioned that forecasting weather is particularly difficult in the Washington, D.C. area. Students, therefore, should not be expected to make completely accurate forecasts with their limited information.

TABLE OF CONTENTS

Introduction iii

Purpose iii

Activities:

1. Observing Weather 1
2. Understanding Humidity 2
3. Measuring Humidity 3
4. Relating Humidity to Other Elements of Weather 3
5. Constructing a Barometer 4
6. Using a Barometer to Measure Air Pressure 5
7. Constructing a Weather Vane 6
8. Using a Weather Vane to Find Wind Direction 7
9. Weather Predicting 7

Student Evaluation Sheet 9

Appendix A 11

Appendix B 13

Activity 1: Observing Weather

Instructional Objective:

The student will be able to describe present weather conditions in each category on the list provided and to identify how they are interrelated.

Procedures:

1. Each student will be given a list for each day he is to make his observations.

2. On several successive days, he will go outside to observe weather conditions; e.g., moisture, cloud cover, temperature.

3. At the end of the observations, he will be asked whether he sees any relationships among the different categories on his list. (e.g., When it is raining, what types of cloud cover are there?)

Materials:

List (See Appendix A.)
Thermometer (optional)

Activity 2: Understanding Humidity

Instructional Objective:

The student will demonstrate, by correctly answering two questions, an understanding of humidity.

Procedures:

1. Add one drop of water to each of two glasses.
2. Seal the top of each glass. (Use something that is waterproof for the seal.)
3. Place the two glasses in a place exposed to direct sunlight or near a light bulb.
4. After the water has evaporated, ask the student where the water is.
5. Select one of the glasses, and add one drop each time the previous drop has evaporated. (There should be a two-day limit to this activity.)
6. Ask which glass has more water in it.
7. Ask which glass has the higher humidity.
8. Explain that the warmer the air in the glass is, the more water the glass will hold.
9. Put both glasses in a refrigerator or dark, cool place. Ask students which glass will have more water. (When the air is cooled, the moisture condenses out of the air.)

Materials:

2 glasses for each student
light bulb or sunlight
eye droppers

Note:

The humidity is the amount of water vapor (moisture) which is present in the air. The glass which has more water added and evaporated will have a higher humidity.

Activity 3: Measuring Humidity

Instructional Objective:

The student will demonstrate the percentage of humidity in the air within 5%, using a hygrometer (wet-dry bulb thermometer).

Procedures:

1. Take the hygrometer outside.
2. Wet the bulb (fill the well).
3. After five minutes, have each student use the chart provided to determine the present humidity.

Materials:

Hygrometer
Chart (See Appendix B.)

Note:

1. Directions for computing relative humidity will be found on the chart.
2. The relative humidity is the percentage of water in the air compared with the 100% which the air is capable of holding at that temperature.

Activity 4: Relating Humidity to Other Elements of Weather

Instructional Objective:

Each student will carry out observations to determine that there is a relationship between relative humidity and other elements of weather.

Procedures:

1. Each student will demonstrate the relative humidity three times a day.
2. He will observe the weather conditions after each check of the humidity (visible moisture, cloud cover, and approximate temperature).
3. He will determine that a relationship does exist between changes in the relative humidity and the other elements of weather.

Materials:

Hygrometer

Note:

Because of the generally unpredictable nature of weather, this experiment may have to be repeated several times before succesful results can be achieved.

Activity 5: Constructing a Barometer

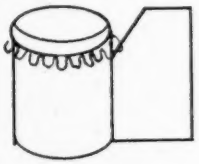
Instructional Objective:

Each student will construct a barometer and interpret a barometric reading.

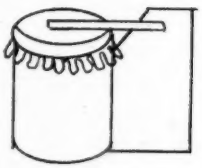
Procedures:

1. Place plastic wrap over the top of a tin can and hold tight with a rubber band.

2. Wrap paper around the can so that part of it is higher than the top of the can. Staple the paper in place.



3. Attach a drinking straw to the middle of the plastic wrap with glue or tape.



4. Push down on the top of the can lightly.

5. Ask student why the straw went up and then came down.

6. Have him mark with a pencil where the straw presently is; record the time; then check several times a day to see whether it moves.

7. When it has been observed to move, explore reasons why it moved.

Materials:

For each student:

can
plastic
straw
paper
tape
rubber band

Activity 6: Using a Barometer to Measure Air Pressure

Instructional Objective:

The student will demonstrate the ability to determine whether the air pressure is high or low, using his barometer.

Procedures:

1. Have the student push lightly down on the plastic wrap of his barometer.
2. Ask why the straw moved up. (There was more pressure on the top.)
3. When the pressure is released, the straw will fall back down (less pressure). Have the student explain why.
4. Select a day with nearly normal air pressure (about 30).* Have the student mark on his card where the straw is.
5. When the straw has moved, ask the student to explain why it moved. (More or less air pressure?)

Materials:

barometer (student-made)
barometer (manufactured), optional

Note:

1. The students may wish to correlate their barometers with an actual barometer by marking the place their straw is pointed with the actual barometric reading.
2. The straw barometer will be influenced somewhat by changes in temperature.

***(The day's air pressure can be found by calling WE 6-1212 on the phone.)**

Activity 7: Constructing a Weather Vane

Instructional Objective:

The student will construct and demonstrate the ability to interpret a weather vane and a wind rose.

Procedures:

1. Place a lump of clay or large potato on a table or desk. (Flatten the bottom of the clay, or trim the potato so that the base is flat.) Arbitrarily place an N on one side.

2. Stick a straight piece of coat hanger wire 8-10 inches long vertically in the clay or potato.

3. Slip a drinking straw over the wire.

4. Cut an arrow from a 4 x 8 index card.

5. Balance the arrow on the straw (held horizontally); then glue the arrow to the straw at the balancing point of the arrow.

6. When set in the wind, the arrow will point toward the direction *from which* the wind is coming.

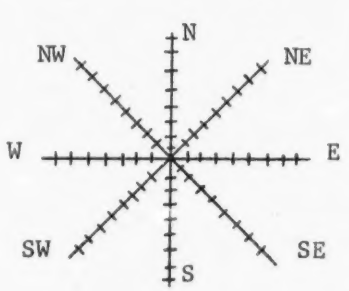
7. Now construct a wind rose on an 8½ by 11 sheet of paper, 8 segments on each line as illustrated.

8. Place the weather vane outside (point N to north), and check each hour during the school day for two days. Record the direction from which the wind is blowing by circling a different segment of the wind rose each hour. Begin with a segment nearest the center.

9. This will show the general direction of the wind for the two days.

Materials:

lump of clay or potato
coat hanger wire 8-10 inches long
drinking straw
4 x 8 index card
glue
large piece of poster paper



Activity 8: Using a Weather Vane to Find Wind Direction

Instructional Objective:

The student will be able to demonstrate the ability to find wind direction with no more than 10% error (36° on a compass).

Procedures:

1. The student places his weather vane outside in a flat place, with the "N" on the base pointing north. Emphasize that the tip of the arrow will point out the direction from which the wind is blowing. (A compass will help the student determine directions.)

2. Have each student check his weather vane several times a day for two school days.

Materials:

weather vane
compass

Note:

The teacher may wish to use the wind rose to illustrate to the class that wind usually blows in one general direction for given periods of time.

Activity 9: Weather Predicting

Instructional Objective:

The student will demonstrate an ability to approximate the next day's weather conditions from observations and interpretations of three instruments and from information provided by the teacher, by recording the kind of precipitation, if any; temperature within 5° F.; and the appearance of the sky (as indicated in Appendix A).

Procedures:

1. Tell the students what the weather conditions are for the surrounding area (within 100 miles), taking the information from the weather map in newspapers or from T.V. weather reports.

2. Each student will observe his instruments and record his predictions for the next day in terms of: 1) kind of precipitation, if any; 2) high temperature within 5° F.; and 3) appearance of the sky.

Materials:

list
wet-dry bulb thermometer
barometer
wind vane
wind rose (optional)
charts
paper and pencil

STUDENT EVALUATION SHEET

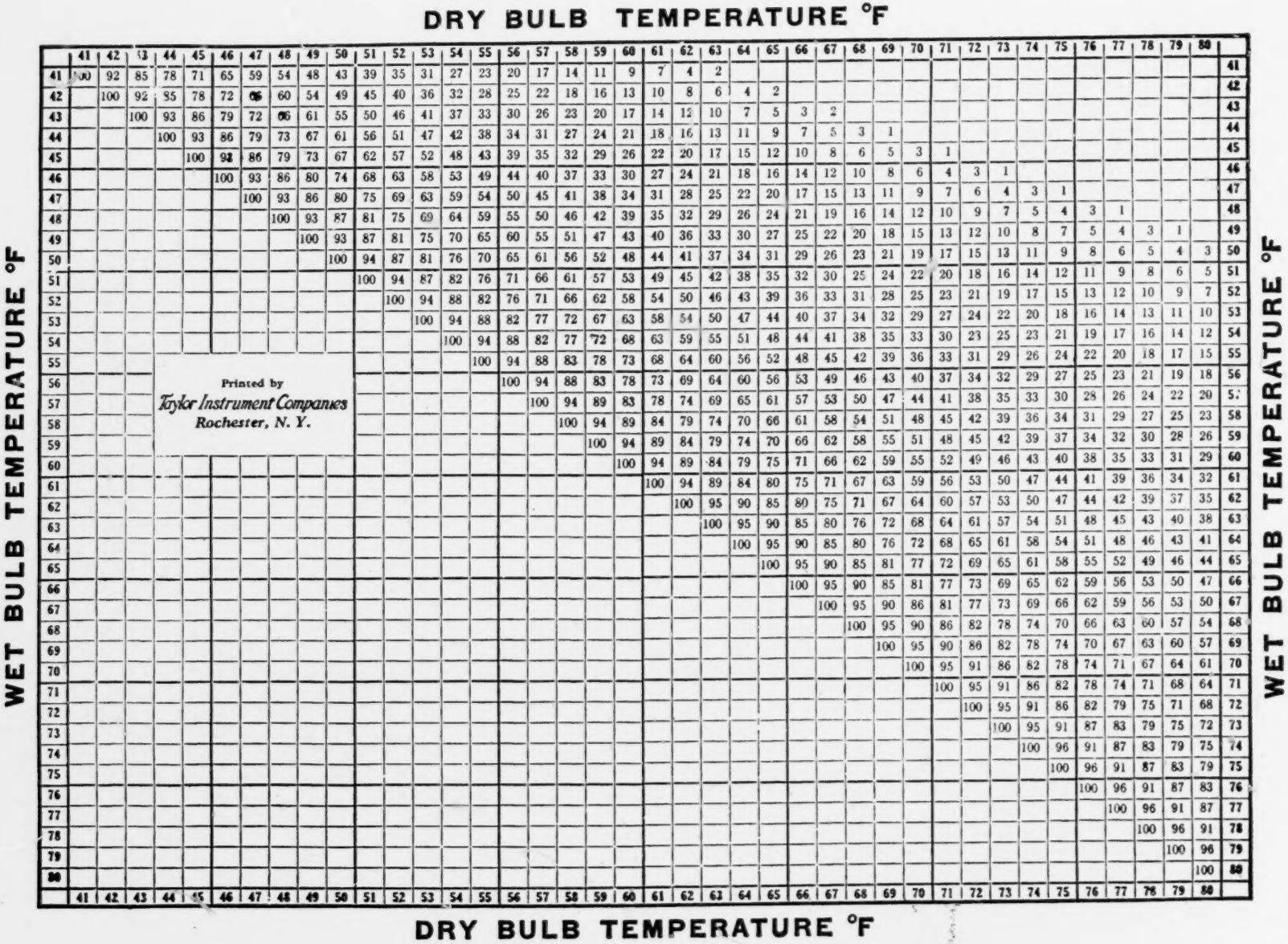
Student's Name_____

		Observed	Not Observed
1.	Describes weather conditions	_____	_____
2.	Demonstrates understanding of humidity	_____	_____
3.	Demonstrates ability to measure humidity	_____	_____
4.	Determines relationship between humidity and weather	_____	_____
5.	Constructs a barometer	_____	_____
6.	Demonstrates ability to read a barometer	_____	_____
7.	Constructs a weather vane	_____	_____
8.	Describes wind direction	_____	_____
9.	Describes future weather	_____	_____

9/10

Appendix A

Moisture	Appearance of Sky	Temperature
rain	clear	hot_____
snow	cloudy	warm____
sleet	overcast	cool_____
hail	haze	cold_____
dew		
fog		
frost		
showers		
none observable		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